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PUBLIC HEALTH WORK IN PORTO RICO.

A REPORT OF THE WORK OF THE INSTITUTE OF TROPICAL MEDICINE AND HYGIENE
OF PORTO RICO,

By W. W. KING, Surgeon, United States Public Health Service.

The following is a report of the work in which I have been engaged, as a member of the Institute of Tropical Medicine and Hygiene of Porto Rico, from the beginning of my connection with it until October 31, 1913.

For the better understanding of the institute and its purposes I shall give the following synopsis of its organization and history:

It was organized under the provisions of an act of the Legislative Assembly of Porto Rico, dated March 13, 1913. It was planned and organized by Maj. Bailey K. Ashford, Medical Corps, United States Army; Dr. W. F. Lippitt, director of sanitation of Porto Rico; Dr. Pedro Gutierrez Igaravidez, of San Juan; and Dr. Isaac Gonzalez Martinez, director of the biological laboratory, service of sanitation of Porto Rico. Dr. Francisco Hernandez was selected for secretary of the institute.

Dr. Lippitt, as director of sanitation, is ex officio administrator of its funds. Inasmuch as he and Dr. Hernandez can not take an active part in the scientific work of the institute, a purely technical commission was selected for that purpose consisting of the other members and Maj. Ashford.

Maj. Ashford is not a member of the institute, but has been detailed by the Surgeon General of the Army as a board, consisting of one member, "for the study of tropical diseases as they exist in Porto Rico." He decided to work in conjunction with the technical commission and was elected a member of that commission by the other members. Dr. Ashford and the writer are not at all concerned with the administration of the institute, but confine themselves entirely to the scientific work of the technical commission.

At the solicitation of the members of the institute, the governor of Porto Rico requested the Surgeon General of the Public Health Service to detail me as a member of the institute. In order to carry out this request, I was detailed as chief quarantine officer of Porto Rico and later as member of the institute. I arrived in Porto Rico September 4, but was too occupied with quarantine matters to do any work with the institute until the 10th of October, when I joined the other members at Utuado, where headquarters had been established for the expeditionary work in the mountains.

The plan of the institute work has three distinct periods:

1. Three months of teaching, instruction of sanitary officials, inspectors, etc.
2. Three months of expeditionary work in the interior mountainous districts.
3. Six months of research work at the laboratory and hospital at San Juan. Study and examination of data and specimens collected during the expedition.

The permanent headquarters of the institute is located in San Juan in a new two-story cement building fronting the bay. On the adjoining grounds are 10 small cement isolation buildings of two rooms each. They were built for a quarantine hospital, but have practically been turned over to the institute by the director of sanitation. Near by is located the excellent laboratory of the sanitation service, which has also been put at the disposal of the institute by its director, who is a member of the institute. The use of these buildings and laboratory equipment will be without expense to the institute except for a share of the running expenses of the hospital.

The appropriation for the institute was \$20,000, which will be expended chiefly in experimental work, hospital expenses, expedition expenses, purchase of medical and other supplies, and salaries. I do not receive any salary, but will receive reimbursement for expense when traveling on business of the institute.

The first three months were devoted, according to plan, to teaching. Instruction was given to 60 students selected from among the corps of sanitary inspectors of the sanitation service. It was designed not only to instruct these officials in the knowledge pertaining to their particular work, but also to determine those who were unfit for the position they occupied. It is intended by the director of sanitation to make this annual course the basis of appointment of these officials in the future.

Lectures were given by Maj. Ashford on hygiene and preventive medicine, Dr. Gutierrez on epidemiology and disinfection, Dr. Gonzalez on bacteriology and zoology, and the director of sanitation detailed various officials of his department to lecture on sanitary engineering, veterinary inspection, chemistry, food inspection, administration and accounting, vital statistics, and sanitary laws and regulations.

There is in preparation a manual in Spanish for the use of these nonmedical inspectors, the various instructors contributing chapters on their special subjects.

In preparation for the three months expedition, lists of medical and surgical supplies were carefully prepared and ordered from the United States. Slow deliveries from some firms delayed the start of the expedition.

This expedition had three aims:

1. Study of the diseases prevailing in the interior.
2. Establishment of a rural ambulant medical service.
3. Education of both planter and peon in elementary hygiene and sanitation.

In the first place, there are undoubtedly many tropical and other diseases occurring more or less frequently in Porto Rico but which while known to exist in other places have never been identified in Porto Rico. There are others such as schistosomiasis, sprue, etc., which present many unsolved problems of interest and importance. Research along these lines is one of the prime objects of the institute.

The second object is one of immense importance to Porto Rico. The rural population of Porto Rico, according to the census of 1910, was 79.9 per cent of the whole. Of these it is estimated by various observers that from 50 to 70 per cent are in need of medical attention.

To meet this condition there is only the municipal physician with a very small appropriation at his command. Municipal physicians seldom make visits to the sick poor in the country. Hence the custom has arisen that if medical attention is desired, another member of the family or a friend sees the doctor in town, details the symptoms as best he can, and carries back what medicine is prescribed to fit the apparent necessities of the patient. Sometimes the sick person is carried long distances over mountain paths in a hammock to town, and it not infrequently happens that he must be carried home again because the hospital is already crowded. Only a few of the larger cities have good hospitals, most of them being small and poorly equipped.

Under these circumstances it results that the greater part of the rural population rely upon home remedies or upon the ministrations of some person in the neighborhood who has acquired a reputation for treating the sick.

Following the work of the anemia commission (Ashford, Gutierrez, and myself) in 1904 and 1905, the insular Government has continued the appropriations for the support of the anemia service, with the result that until the present time about 300,000 persons have been treated. The dispensaries of the anemia service are located in the towns, and the same objection holds against them—that they can not reach the remoter districts of the municipalities. It is to these out-of-the-way places that the ambulant rural service will carry medical relief.

In the third place, the expedition proposes to show both planter and peon their sanitary errors, and what can be done to correct them and how to protect themselves as much as possible from the communicable diseases to which they are exposed. The enforcement of sanitary laws and regulations is almost impossible until there is some

general understanding of hygiene and sanitation, and some interest in their application.

It was determined to establish the expedition at some point in the mountains of the interior, to locate there a large out-patient clinic and a small hospital, and a clinical laboratory. From this center subclinics will be established in certain localities where a number of plantations are conveniently grouped.

The equipment of the expedition consists of—

1. A portable clinical laboratory.
2. A large stock of drugs, mostly in tablets, instruments, and dressings.
3. A 30-bed hospital.
4. Horses and pack mules, portable medicine cases, and cases of instruments, etc.

The site selected is about 1 mile from Utuado, at the coffee and sugar plantation known as San Andres. In the large country house are located the laboratory, dispensary, examination rooms, and quarters for the members of the technical commission and its assistants. A two-story servant's building was converted into the hospital—men's ward on the ground floor and women's ward on the second floor.

The location is central to a large municipality of some 40,000 souls, and can be reached in all directions by roads and trails. Inasmuch as the material for study and research must be culled from a large number of patients, it was very evident that some means must be taken to attract them in large numbers. Nothing could serve this purpose as the opening of an "anemia station" for the treatment of uncinariasis, more especially as this is the place where in 1904 the anemia commission inaugurated its campaign and where there is yet a lively remembrance of the benefits of treatment for this disease. The district is still heavily infected in spite of the large number of persons who have been treated, and it was known that the opening of an anemia dispensary would bring a great number of patients.

The director of sanitation put under the control of the institute four ambulant anemia dispensaries provided for by the last Porto Rican Legislature, thus giving the institute the means of handling the anemia patients. These dispensaries, for the time being combined, bring to the institute four young physicians, graduates of American medical colleges, who have shown themselves to be active and capable young men. They will in the near future take the field as the first of the ambulant medical service above mentioned. The training which they are receiving looks to that end. One of them acts also in the capacity of official representative of the administrator of the institute.

The technical commission established themselves at the selected place on September 15 and for a week were occupied in unpacking

and arranging supplies, making necessary changes in buildings, fitting up the hospital, laboratory, etc. Treatment of patients was begun on September 23.

The personnel of the expedition at that time consisted of: Maj. Bailey K. Ashford, Dr. Pedro Gutierrez Igaravidez, Dr. Isaac Gonzalez Martinez, members of the technical commission; Dr. Pedro Malaret, jr., representative of administrator; Dr. Federico Trilla, Dr. Bernabe, assistants to the commission and physicians of the anemia service; Mr. Victor Lopez Nussa, chief clerk; Mr. Artau, Mr. Herrerio, pharmacists and practicantes; one female superintendent of hospital, one graduate nurse, one student nurse, one hospital helper, one housekeeper, two cooks, one maid-servant, three peons.

The technical commission was later increased by the arrival of Dr. W. W. King, surgeon, United States Public Health Service; Dr. Mestre and Dr. Arbona (relieving Dr. Bernabe), anemia physicians; two additional pharmacists and practicantes, and several miscellaneous employees.

On account of urgent quarantine business at San Juan and Ponce, I was unable to join the commission before October 10.

From the opening of the clinic to October 31 there have been registered about 7,450 patients, who have made about 25,000 visits, an average of about 625 daily. This should be compared with the number treated here by the anemia commission in 1904 (4,490) and the number at Aibonito in 1905 (6,152) during periods of 3 and 9 months, respectively.

The patients are formed in lines, men and women separately. Those coming for the first time are directed to the registrar's desk, where they are given a small identification card (inclosed and marked "A") and a larger clinical card (inclosed and marked "B"), both bearing the same serial number. The identification card remains in the possession of the patient and must be presented at each visit. It serves as his ticket of admission to the examination and by the number to find the clinical card in the file. At the registration desk the nonmedical parts of the cards are filled in and the patient passes to the lines leading to the examination desks, where one of the anemia physicians makes a microscopical examination of the feces, notes the findings on the clinical card, puts a few pertinent and comprehensive questions to the patient and fills out the medical parts of the card. A little practice enables one to do the talking with the patient while making the microscopical examination, thus saving valuable time. If the case is one of uncinariasis only, the prescription is written and the treatment noted on the card, which is then filed. The patient then passes to the lines at the dispensing counter where he receives his medicine and is told how to take it. Unless there is some reason to the contrary, patients are told to return in one week.

It is a well-understood thing among these people that they must bring a specimen of their feces, and they seldom fail to be provided with it. As safety matches are the only kind used in Porto Rico, the empty boxes are quite plentiful and were quickly adopted by these people for the purpose of bringing the specimen. Pill boxes, and in fact all kinds of receptacles, even leaves, are used, but the "cajita" or little box has become synonymous with specimen of feces. In case the patient does not come so provided, he is given medicine to relieve his principal symptom and told that on his next visit he must bring the "cajita" if he wants medicine for permanent relief. A notation to this effect is made on his card.

This part of the work is done under the portico in front of the main building, temporary palm bark extensions having been made to the roof to shelter large enough space. On one side are the examining physicians and on the other the registration desk and dispensing counter. The lines of patients form in the yard.

Uncinariasis patients at their second and third visits are sent direct to the dispensing counter where one of the anemia physicians is on duty. He questions them as to the effect of the medicine, modifies the dose if necessary, etc., making the notation of the visit and the medicine given, on the card. At the third visit the patient is told that he must bring his specimen of feces every time thereafter until told not to do so. At the fourth and later visits he goes to the examining side again for examination of feces. This examination is omitted at the second and third visits because we found, during the work of the anemia commission at Aibonito in 1905, that three doses are generally required to expel 95 per cent of the uncinariae. Patients being treated for ascaris infection are required to have their feces examined at each visit. After treatment when the feces show no uncinaria ovum the patient is given Blaud's pills and told to bring another specimen next week.

In addition to uncinariasis the anemia physician prescribes for ascariasis and many ordinary diseases and simple complaints that do not require much examination or time. Other cases are marked "special" and are sent to the members of the institute for examination and treatment. These special cases will be explained later.

The members of the institute work inside the house where four rooms have been set aside as follows:

1. A clinical laboratory.
2. An examining room.
3. A reception room.
4. A drug room and dispensary.

The laboratory is well equipped for the clinical purposes for which it is intended, such as examination of urine, blood, feces, pus, and other material from patients. Most of the pathological anatomy specimens will be kept for study in San Juan.

The examination room is equipped with examining table, stethoscopes, endoscopes, aesthesiometers, and other instruments of precision. Each member has a writing table on which he keeps a file of clinical cards with the data of his special cases. Operations are also done in this room for lack of a better place.

The hospital is reserved for cases under observation or for those patients who are too ill to be treated in their homes.

At the general clinic outside the building the physicians are instructed to send all special cases to the reception room inside the building. These are:

1. Persons who have not intestinal parasites and whose ailment requires more detailed attention.
2. Persons having intestinal parasites, who have complications or other diseases of importance.
3. Particularly those whose feces show ova of schistosomiasis, or who may be suspected to be suffering from amebiasis, malaria, skin lesions, tuberculosis, trachoma, sprue, etc.
4. Very extreme cases of uncinariasis.
5. Any person whose disease or symptoms seem to be of special interest.

This is the general scheme of work of the institute at present, but on account either of lack of personnel, or extraordinary rush, the members of the institute are obliged to help out at times at the general clinic.

To date the following special cases have been treated by the members of the institute:

Skin diseases, various.....	176
Venereal diseases.....	26
Schistosomiasis ¹ (Schistosoma mansoni).....	52
Malaria.....	5
Amebiasis (Amebic dysentery).....	4
Pulmonary tuberculosis.....	44
Sprue.....	17
Splenomegaly (cause undetermined).....	2
Rheumatoid arthritis.....	3
Favus.....	1
Hypertrophy of breasts in a man of 45 or 50 years.....	1
Anterior poliomyelitis.....	2
Cretinism.....	1
Paralysis agitans.....	1
Acute articular rheumatism.....	1
Pertussis.....	2
Lupus.....	1
 Total.....	 338

¹ About 70 more of these cases were recorded on the cards of the general clinic before they were made special. As the patients return they are being taken up on the special cards.

There are a number of other cases in which a definite diagnosis has not yet been made, and of course these have not been included in the above list.

The remainder of 734 cases which present only matters of minor or general interest may be classified as follows:

	Per cent.
Constitutional diseases, such as rheumatic affections, marasmus, etc.....	8
Diseases of the digestive tract, chiefly enterocolitis and constipation.....	19
Diseases of the respiratory tract (nose and throat, 8 per cent).....	22½
Diseases of the circulatory system.....	3
Diseases of the urinary tract.....	2
Diseases of the blood.....	3
Diseases of the nervous system.....	22½
Diseases of the eye (exclusive of trachoma).....	5
General surgery.....	7
Gynecological diseases.....	8

There have also been recorded 42 surgical operations of all kinds and 313 laboratory examinations. The latter record by no means includes all that have been made, because in the hurry of our large clinic it has sometimes been forgotten to make the note in the record book.

In the work of the technical commission special attention is at present being paid to the following diseases:

Schistosomiasis.—Careful clinical and epidemiological notes are taken with the view of determining means of infection, intermediate host, and cure. At the present writing it seems rather difficult to reconcile Loos's theory of infection through the skin to conditions here.

"La Bonita."—A name given by some of the country people to an affection whose chief symptom is anasarca. It seems to be limited to the country districts and sometimes occurs epidemically. Nephritis is present in a large proportion of cases, and it is considered by some physicians to be an acute nephritis due to ordinary causes. It remains to be seen whether it is a disease entity or not.

Sprue.—There have been a number of cases recorded from the country where it was not believed to exist.

Amebiasis (amebic dysentery).—Due to the entameba histolytica. Liver abscess is rare in Porto Rico. Emetine hydrochloride has given excellent results.

Malaria.—So far only two barrios (subdivisions of municipalities) have been found infected, and the extent seems limited. One focus is of the estivo-autumnal type.

Venereal disease.—Rarely found in the country districts. Most of our cases have come from towns.

Uncinariasis.—These cases have not yet been counted, but we estimated that at least 50 per cent of our patients suffer from uncinariasis only. The type of the disease is milder than that which we formerly encountered here, due, we believe, to the effect of anemia work in this

section. Severe cases, sometimes with less than 10 per cent hemoglobin, are, however, the commonest cause of grave illness. The people have come to realize the cause of their anemia and the result of treatment, hence the great popularity of the clinic in spite of the fact that they know the unpleasantness of the treatment and that at this season they come long distances to the clinic. It is now the height of coffee picking, the one period of the year when there is plenty of work for all, yet they will take two days each week from their work for the sake of being cured—one day to come to us and the other day at home to take the medicine.

Trachoma.—Its presence in Porto Rico has been well known, but there are widely divergent opinions as to its prevalence and distribution. With a view of determining these questions a series of examinations are being made. At the same time efforts are being made to bring out other facts about the disease.

We expect to close our work here on December 15 and return to San Juan, taking with us data and material to be worked over there.